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DAS1

Data Acquisition System



bartington.com

Bartington® Instruments



DAS1
Data Acquisition System

The DAS1 is a multi-sensor data acquisition system designed to sample and process measurements from a wide range of Bartington® Instruments three-axis magnetometers. It is suitable for any application that requires a large number of sensors to be handled.

The system includes a PXIe unit (including A-D cards) and one or more programmable Decaports. Ten magnetometers can be connected to each Decaport and up to eight Decaports can be connected to one PXIe chassis. The system is mounted in a portable 19-inch rack-style case.

The DAS1's PC-based processing allows software designers considerable flexibility. A pre-compiled LabVIEW™ application is supplied, and source code is available to help customers develop their own software.



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Features

- Compatible with most Bartington® Instruments sensors.
- Can support up to 80 three-axis magnetic field sensors.
- Programmable LabVIEW™ software included.

Product Identification

The DAS1 system can be specified as follows:

Product Name	1 Decaport	2 Decaports	8 Decaports
DAS1	10	20	80

Hence DAS1-10 is a DAS1 system with a single Decaport, able to connect up to 10 sensors.



Specifications

The minimum DAS1 system comprises:

- Decaport Analogue Interface Module
- PXIe Data Acquisition Unit
- 19" rack case
- Rugged enclosure
- Flight case.

Machanical	
Enclosure	Wheeled 19-inch rack-mounting case
Dimensions: With covers fitted (not including wheels) Without covers fitted	740mm D x 575mm W x 424mm H (1 Decaport, +44mm for each additional Decaport) 630mm D x 575mm W x 424mm H (1 Decaport, +44mm for each additional Decaport)
Weight: DAS1-10 DAS1-20 DAS1-30 DAS1-40 DAS1-50 DAS1-60 DAS1-70 DAS1-80	 47.5kg 64kg 80.5kg 97kg 113.5kg 130kg 146.5kg 163kg

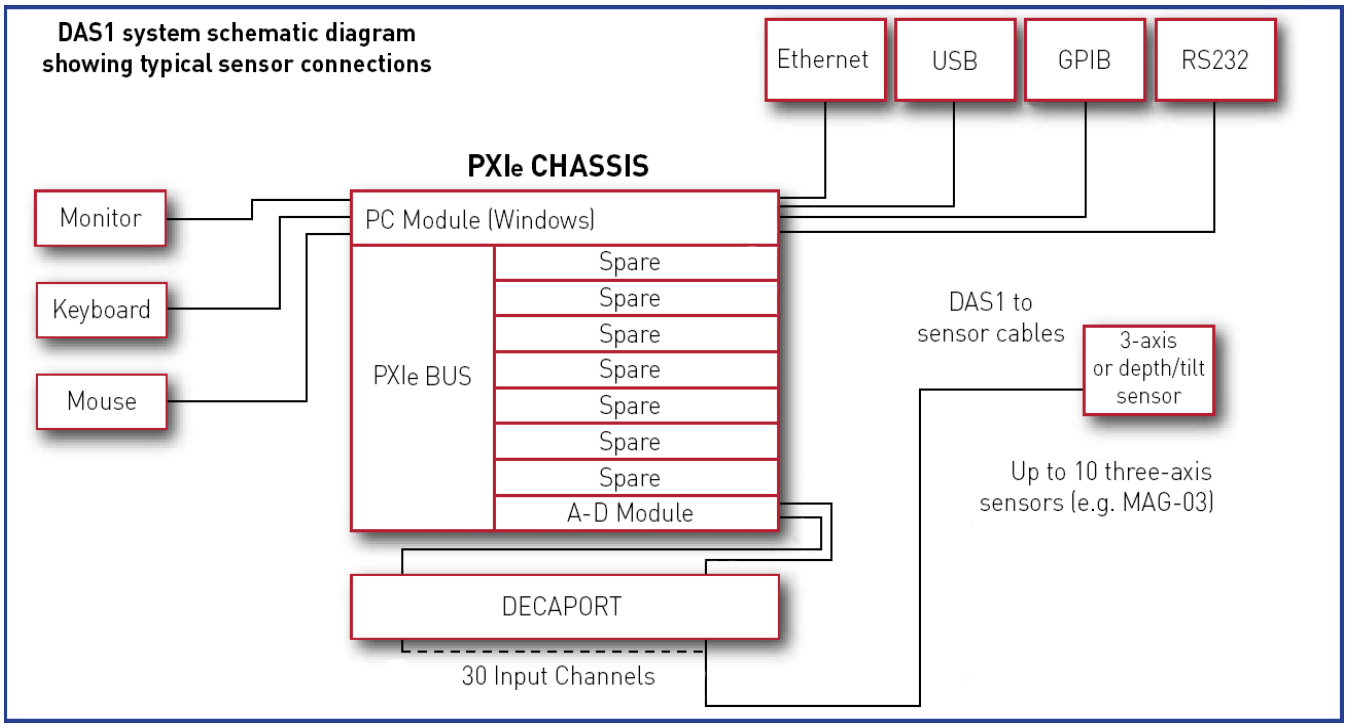
Cables

Each system can be supplied with land or marine compatible cables (up to 1km length, sensor dependent) for connecting the sensors to the Decaport. One metre cables for connecting the Decaport to the PXIe Data Acquisition Unit are supplied as standard.

Compatibility

The DAS1 system is also compatible with depth, tilt, and pressure sensors.

Hardware


DAS1 system schematic diagram
showing typical sensor connections
Ethernet
USB
GPIB
RS232
PXIe CHASSIS
Monitor
Keyboard
Mouse
PC Module (Windows)
PXIe BUS
Spare
Spare
Spare
Spare
Spare
Spare
Spare
A-D Module
DECAPORT
30 Input Channels
DAS1 to
sensor cables
3-axis
or depth/tilt
sensor
Up to 10 three-axis
sensors (e.g. MAG-03)



Decaport Analogue Interface Module

Each Decaport Analogue Interface Module has 30 input channels, allowing connection of up to 10 three-axis sensors.

The Decaport is primarily intended to support Bartington® Instruments' magnetic field sensors, but incorporates programmable features to support a wide range of sensor types (e.g. depth, pressure, e-field). It is software-configurable for single-ended or differential analogue sensor inputs, anti-aliasing filters, frequency response and sensor supply voltage.

The Decaport also provides power when used with the Bartington® Instruments range of sensors.





Features

- Single-ended analogue output to PXIe Unit
- Option to monitor the sensor power supply voltage, current and electrical leakage
- Ability to activate the magnetometer test function (when available on magnetometer)
- Comprehensive ESD surge protection on the sensor input
- Standard 19-inch rack-mounting
- Operates with sensor cables up to 1km long (sensor dependent)



Specifications

Performance	
Number of input channels	10 three-axis magnetic field sensors
Signal input voltage	±10V differential or single–ended
Common mode input voltage	±8V: balanced / differential output sensors ±3V: single ended sensors
Absolute maximum input voltage	±15V on any input pin
Sensor power output	±12V or ±14V limited to 50mA per sensor channel Sensor power supply voltage, current and electrical leakage monitoring Power output protected by self-resetting semiconductor fuses
ESD protection	Comprehensive ESD surge protection on the sensor input
Filter	Type Butterworth 2-pole 12dB per octave low pass Frequencies (software selectable): 10kHz ,1kHz, 100Hz, 10Hz
Maximum cable length (recommended)	1km
Power supply voltage	85 to 264 V AC 50/60Hz automatic selection
Power supply current	1100mA (115V) / 640mA (240V) typical
Analogue outputs	Balanced ±10V each leg
AFPI Inputs	5V TTL Logic compatible

Environmental	
Operating temperature range	-20ºC to +70ºC
Relative humidity	0 to 90% non-condensing

Mechanical	
Dimensions	Standard 19-inch rack-mounting 1U (482 x 44 x 254mm)
Weight	3kg
Input connector (front panel)	Hirose RM15TRD-10P (mating Hirose RM15TPD-10S - not supplied)
Output connector (rear panel)	68-way Harting 6001 068 5232
Power input (rear panel)	3-way IEC with integral filter (standard mains cable provided)
Auxiliary connector (rear panel)	15 way D type

PXIe Data Acquisition Unit

The PXIe Data Acquisition Unit is a rugged, modular, programmable PC-based system that can perform Analogue-to-Digital conversion and most data processing requirements for the analysis of signals from arrays of magnetometers. A chassis-based, plug-in board design allows flexibility in configuration.

The standard chassis includes 8 expansion slots. Each A-D board has 30 input channels supporting up to 10 three-axis sensors connected via a Decaport unit. Hence a fully populated large chassis can process data from 80 three-axis sensors. Data sampling rates will be dependent on the application software, but the PXIe Data Acquisition Unit hardware can sample all channels at a rate of up to 16.625ks/s with 16 bit resolution.

Specifications

PXIe Cardframe NI™ PXIe-1088	
Input Rating	100 to 240 VAC, 50/60Hz, 7 to 3.5A
Operating Temperature Range	0°C to 40°C
Storage Temperature Range	-40°C to 71°C
Relative Humidity	20 to 80%, non-condensing
19-inch Rack Mount Kit	781634-01
Slot Blockers	199198-01
Power Cable (UK)	763064-01

Processor NI™ PXIe-8822	
Processor	Intel i3 11100HE 2.4GHz 4-cores
Memory (RAM)	8GB
Storage (ROM)	512GB SSD
USB Ports	4 x USB 2.0 2 x USB 3.0
Ethernet	2 x i225
Serial	RS232
GPIB (IEEE 488 controller)	No
Operating System	Windows 11 64-bit

PXIe-6363 DAQ module	
Input	Analogue
Number of channels	16 differential or 32 single ended
ADC resolution	16-bits
Maximum sampling rate	2.00MS/s single channel, 1.00MS/s multi-channel
Timing accuracy	50ppm of sample rate
Timing resolution	10ns
Input coupling	DC
Input range	±10V, ±5V, ±2V, ±1V, ±0.5V, ±0.2V, ±0.1V
Maximum working voltage for analogue inputs (signal + common mode)	±11V of analogue input GND
Input FIFO size	2,047 samples
Scan list memory	4,095 entries
Overvoltage protection Device ON Device OFF Input current during overvoltage condition	 ±25V for up to eight analogue input pins ±15V for up to eight analogue input pins ±20mA max / analogue input pin

The latest specifications for National Instruments™ components (PXIe-1088, PXIe-8840 and PXIe-6363) can be found at www.ni.com.

Sample rate versus number of channels			
Number of magnetometers	Number of data channels	Sample rate (Ksamples/sec)	Bandwidth (kHz)
1-10	3-30	31.25	15.625

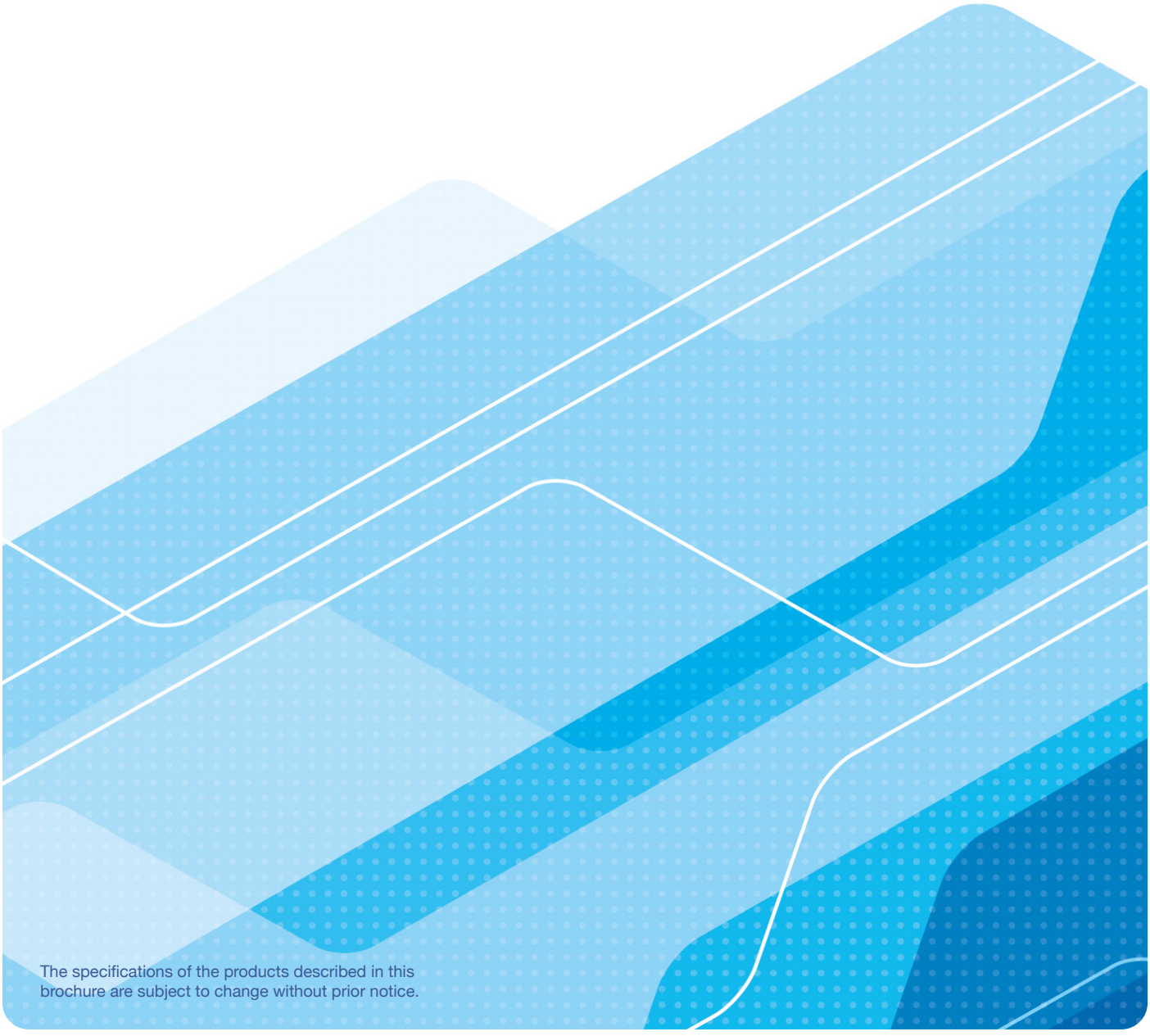


Software

The DAS1 is supplied with Windows™ 11 installed and with a DAS1 software application, based on LabVIEW™. This lets users quickly configure the DAS1 to monitor signals from attached sensors and establish that the system is functioning correctly, without providing the functionality of a full magnetic range facility.

As the software requirements for each individual range implementation will vary, please contact Bartington® Instruments to discuss the software options that are available.





The specifications of the products described in this brochure are subject to change without prior notice.

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Bartington® Instruments

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